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AUTHOR Sutton-Smith, Brian
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ABSTRACT

Piaget's early contribution to theorizing about play is discussed critically with reference to three major interrelated problems. These are: (1) that despite their equipotentiality in Piaget's theory of intelligence, imitation and play are not conceptualized as making an equal contribution to cognition, play taking a subordinate role; (2) that this inequality was brought about by Piaget's focus on directed or rational or convergent, rather than undirected or imaginative or divergent, cognitive operations; and (3) that it was also a result of presupposing play to be a predominantly infantile state of development, a not uncommon assumption in the work ethic ideology of Western culture. A review of three kinds of research--therapeutic, animal and child experimental--indicates support for Piaget's notion that play does not contribute as importantly to cognition as do imitation and exploration. It is argued, however, that Piaget has paid attention only to lower level and more content influenced categories of play. Borrowing from communication and cultural theories of play, a hierarchy of structural categories is proposed which suggests deeper levels of operations in play. These categories are reframing, reversal, abstraction of prototypes, theme and variation, bounded space-time, and modulation of excitement. It is also argued that Piaget tended to study the infant in a solitary situation and to assume that his own presence had minimal influence on the infant's behavior, and that this predisposed him towards a view of play as reverie. It is proposed that a more comprehensive view of play should take into account adult and social-cultural forms of play. (Author/SS)

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Piaget, Play and Cognition, Revisited

Brian Sutton-Smith

University of Pennsylvania

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Introduction

The 1970's have already witnessed the publication of over twenty research oriented books on the meaning of play. One has to include the prior fifty years to arrive at an equivalent number of works, even with a fairly liberal definition of research and social science. The three major influences in this novel play research appear to be Bateson (1956, 1972), Berlyne (1960) and Piaget (1962). Bateson speaks to play at the cultural level and in largely communication theoretical terms. Berlyne focuses on play, along with humor and art in terms of revised forms of stimulus-response theorizing. And Piaget discusses infant and early childhood play in terms of his own theory of cognition.

In this paper I will consider Piaget's (the pre-1960 Piaget's) contribution to the current state of the art although, as it will turn out, Berlyne and Bateson must also be included. I add also that I am more concerned with how to theorize about play than I am with how to theorize about Piaget. I begin by acknowledging the very important stimulus and encouragement that Piaget's Play, Dreams and Imitation in Childhood (1951) had for me. I had begun my own studies of children's play and games in the late 1940's and in those days found little encouragement for such esoteric concerns except amongst pre-1930 psychological studies (Lehmann & Witty, 1927) and

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amongst folklorists (Gomme, 1894). To read Piaget was to receive the sudden gift that one's intuition about the primary importance of play and games to children and therefore to the study of childhood was not a totally deviant and trivial obsession. I feel sure that some others felt the same sense of relief, and that even those who didn't care for the subject matter were subsequently prepared to consider that this least serious matter might indeed be quite serious after all. Almost thirty years after Piaget's book one now has the pleasure of seeing that there are even some systematic social scientists who find the subject matter the most serious one that they care about. What Piaget did at one stroke for psychology is what Huizinga (1944) had done ten years earlier for history. He suddenly made the subject of play a critical aspect of a major theory of child development, just as Huizinga had made it a critical aspect of a major theory of human culture. It was no longer possible to be a concerned student of child development, or at least of cognitive development, without tackling this aspect of the Piagetian theory.

Not unnaturally, however, after the first flush of salvation, troubles began to arise. Obviously my commitment to play was in the first place emotional and in the second place scientific. For me it was a metaphor of a kind of living and a kind of distancing from conventional behavior. And persons under the sway of such unreason do not like to see their loved ones trifled with lightly.

So I worried over what I liked and disliked in Piaget, typified perhaps by his brave contention: "In reality, the child has no imagination, and what we ascribe to him as such is no more than a lack of coherence . . . " (1962, p. 131). In a visiting year at Clark University (1962-1963), and with much stimulation from Joe Glick and Bernard Kaplan, I came to believe that there were three major interrelated problems with the Piagetian play theory. These were described in my article of 1966. I will repeat each of these objections now, and my talk will be a kind of retrospect on the status of each problem and what we have learned about it from the subsequent literature. More particularly I want to look this time at what support I can find

for Piaget's side of the case. The problems that I cited were (1) that despite their apparent equipotentiality in his theory of intelligence, Piaget had contrived an assymetry or imbalance between the contributions to be made to cognition by imitation and play-- imitation was the star performer and play was its aborted partner; (2) that this inequality was brought about by Piaget's focus on directed or rational or convergent, rather than undirected or imaginative or divergent, cognitive operations; (3) that it was also a result of presupposing play to be a predominantly infantile state of development, a not uncommon assumption in the work ethic ideology of Western culture.

I. The Asymmetry of Imitation and Play in Cognitive Activity

In Piaget's view of intelligence there are states and transformations. The first register themselves in the mind through a figural component derived from perception, imitation and imagery. The second, the transformations, are the cognitive component of mind which derive from the subject's own actions. Play is of this latter kind, and occurs when there is a primacy of such subjectivity and no attempt to submit the transformation to the criterion of objective fact. Play is pure assimilation just as imitation is pure accomodation. In symbolic activity, the figurative aspects of intelligence (imitation, etc.) are converted into interiorized imitations and as such become available for the transformations of cognitive activity (or play). Such interiorized imitations (or language or images) are the essential bases of the signifiers used in all symbolic activity. Play, on the other hand, which provides us with an extreme illustration of how transformations of these signifiers can operate, does not appear to be able to contribute equivalently its own kind of transformations to serious cognitive activity. We have no problem knowing how the imitation derived signifiers get used, but we are at a loss to discover in Piaget's writings how the play derived transformations get used. In fact, we

are led to understand that they cannot get used to constitute rational thought processes, because they are by nature subjective, distorting, confusing and deforming (to use some of Piaget's own signifiers).

Apparently our view that there is some imbalance between the adaptive cognitive contributions of imitation and play is not entirely solipsistic. Recently others have taken it up also. Thus, Brian Vandenberg writes:

> Piaget (1979) has stated subsequent to his exchange with Sutton-Smith, that development proceeds through the progressive equilibration of assimilation and accomodation which can be expressed in terms of". . . centration and decentration. The systematically distorted assimilations . . . mean that the subject remains centred on his own actions and his own viewpoint . . . the gradually emerging equilibrium between assimilation and accomodation is the result of successive decentrations, which make it possible for the subject to take the points of view of other subjects or objects themselves . . . For cognitive progress is not only assimilation of information; it entails a systematic decentration process which is a necessary condition of objectivity itself." (Piaget, 1970, p. 710)
>
> Thus, play is centration since assimilation predominates and is corrected through the decentering action of imitation, where accomodation dominates. Imitation serves as the "decenter" because it moves thought away from the idiosyncratic perspectives of play toward the externally valid reality; play can only egocentrically distort while imitation can decenter. . . Consequently, the cutting edge of deqelopment is imitation, from which new and accurate images of reality are generated. Play serves a kind of cognitive holding function which facilitates the assimilation of new images, but itself does not create new directions in thought. (Vandenberg, 1979)

Greta Fein comments on the paradox that Vygotsky and Piaget pursue opposite and reversible paths in their conceptions of play. She says:

> For Vygotsky the press for symbolic play is emotional, for Piaget it is intellectual. And yet, in developing their positions, these theorists switch sides. What for Vygotsky is created by unrealizable wishes becomes an occasion for the organization of meaning in language and thought. What for Piaget is created by the functioning of intelligence becomes a medium for the expression of personal concerns. (Fein, 1978)

And Ken Rubin:

> Our second criticism of the Piagetian position stems from an apparent inconsistency vis a vis the causes of the decline of egocentric thought and conversely the onset of social thought in childhood . . . Piaget (1932) feels strongly that peer interaction and peer conflict serve to decrease egocentric thinking and to increase accomodation (and thus compromise) in young children.

> On the other hand, play, during which much peer interaction takes place, is seen as pure assimilation or as the most characteristic reflection of egocentric thought. As a result one may come away with the opinion, following a reading of Piaget's position concerning play, that such activity is not particularly conducive to the onset of socialized thought. We, of course, beg to differ from Piaget. It is our belief that the Piagetian definition of play as pure assimilation is unreasonably restrictive. (Rubin & Pepler, in press)

Given this consensus across several current play researchers and realizing that it could easily be a false consensus (Youniss, 1978), what then can be said on behalf of Piaget's view that "the essential property of play . . . (is) . . . the deformation and subordination of reality to the desires of the self"? What can be said on behalf of his view that it serves to preserve ego continuity and to consolidate prior adaptive operations during the infantile period when the child lacks more realistic adaptive operations?

First, these are the kind of descriptions that for many years have been used in child play therapy. They are descriptions likely to be true of children sufficiently overwhelmed by conflict and anxiety that such play as they can attempt is very much of a defensive and wish fulfilling exercise. Second, in a quite different and clearly more "structural" emphasis, Piaget's view also receives corroboration in some descriptions of animal play. Thus Loizos (1967), discussing animal motor patterns, describes them as involving situations where: (1) the sequence may be reordered; (2) the individual movements making up the sequence may become exaggerated; (3) certain movements within the sequence may be repeated more than they would normally be; (4) the sequence may be broken off altogether by the introduction of irrelevant activities and resumed later--fragmentation; (5) movements may be both exaggerated and repeated; (6) individual movements within the sequence may never be completed and this incomplete element may be repeated many times.

Now this sounds like the sort of egocentric, fragmentary, unaccomodated activity that Piaget is talking about. It is true that some animal investigators (Reynolds,

1976; Bruner, 1976) see these "fragmented" behaviors as more likely to occur in species where greater flexibility is needed, which is not at all what Piaget has in mind, but still we do have at least some comparability at the descriptive level. Third, another direction in which we can take the inquiry is into the exploration literature, which although it has been more influenced by Berlyne than by Piaget, has established a distinction between exploration and play which has some parallel with Piaget's distinction between imitation and play. If we think of a continuum between accomodative and assimilative activity, while play represents the extreme of assimilation and imitation the extreme of accomodation, exploration is presumably at a point removed from imitation in the direction of the center of such a continuum. It is closer to imitation than it is to play. And in the extensive experimental literature on the relationships of exploration and play, exploration has very clearly been found to have the priority as an adaptive response. Within exploration there have been those most interested in responses to novelty, complexity, etc., responses that have come to be known as specific exploration (or curiosity), and there have been those more interested in responses which are activated more by boredom and habituation, which have come to be known as diversive exploration. Hutt (1979) has taken this distinction and rephrased it as a difference between investigation and play which she describes as follows:

Insert Table 1 about here

She describes her classic study and her conclusions:

> In order to study exploration in pre-school children, a new "toy" was designed . . . Into this toy were built in sounds and lights which were contingent upon certain operations upon the toy. For instance, pushing a lever in one direction might work a bell (or an orange light) and in another a buzzer (or a green light) . . . In doing this we hoped to find out, quite precisely, how much a child learned about the properties of the toy through exploration.
>
> In the course of our studies we saw altogether 128 3 to 5 year-olds and the pattern of specific exploration was fairly similar in all children (Hutt,

1971). First, the child would approach and inspect the toy, and then investigate it, some more tentatively than others. During this period of active investigation and manipulation the child's posture and expression were of concentration; the child closely watched as he investigated all aspects of the toy. Having done so, the child then began to use the toy "playfully." Such behaviour was readily distinguished from the specific exploration which preceded it: the child's posture and expression were now relaxed, he did not need to watch closely as he handled and manipulated it and there might follow any one of a variety of responses. Having learned the properties of this new toy, he was using that knowledge in his play. The quest changed from inquiry to invention and the child no longer asked himself "what does this object do?" but "what can I do with this object?" And while investigation declined with time, playful activity increased to a peak before declining. . . (The distinctive features of investigation and play, as we observed them in this series of studies are given in Table 1A and formalised as laws pertaining to specific and diversive exploration in Table 1B. It may be seen that while specific exploration is obligatory, diversive exploration is optional and idiosyncratic.)

Most surprisingly, we found that if children engaged in play with this toy prematurely, that is, before they had learned all there was to know about it, they might not acquire any further information during their play. Thus, a boy, having found the bell and incorporated it in a game in which he ran around the room filling a truck and ringing the bell twice each time he passed the toy, failed to find out about the buzzer. Learning during this "playful" phase therefore, was largely accidental. If, during such play, the child chanced upon the lever-movement which operated the buzzer, then a further period of exploration would ensue. Thus, playful behaviour may actually preclude learning, in the sense of acquiring information from a novel or unfamiliar source. It is easy to see how this is so: upon presentation of something new, something not encountered before, the child is set to investigate and find out about it. The orienting reaction after all, is one of the most primitive and earliest manifest responses in our behavioural repertoire. Pavlov termed it the "what-is-it" reflex. New materials, objects or toys are not involved in play until the child feels quite familiar with them. It is important to stress that this criterion is a subjective rather than an objective one--playful behaviour emerges when the child feels he has learned all there is to know about an object rather than when he has actually learned about it. Herein lies the danger of the premature appearance of symbolic play, for we should not expect learning necessarily to occur during such activity. The motivation for the behaviour is clearly different--the child engages in fantasy or symbolic play because he chooses to, for his own enjoyment, and he seeks no other fulfilment.

As a result of these distinctive motivational states associated with specific and diversive exploration, we found that children would tolerate interruption of one but not the other. In other words, children did not seem to mind unduly if an adult interrupted when they were "playing" but did get annoyed if an attempt at intervention was made while they were exploring. It appears that exploration is an activity akin to problem-solving and arouses, in Berlyne's terms, perceptual curiosity, a state of drive or discomfort which can only be alleviated by specific exploration; during such exploration the child is likely to absorb the new information at a rate compatible with its cognitive

> capacity and hence appears to resist any attempt to hasten or impede him. During playful activity, on the other hand, the primary motive being enjoyment, the child does not mind interruption. (Hutt, 1979)

We have quoted Hutt at extensive length because here is very important evidence which suggests that the imbalance that Piaget has placed into his description of imitation and play may indeed truly represent the state of nature. Hutt has further shown that in exploratory activity, as in problem solving, the heart rate is quite regular, whereas in play it is most variable. "The child's behavior was video-recorded by one camera, while its heart rate was telemetred and the paper tracer recorded by another camera. The two pictures were then superimposed to give a composite picture of behavior with accompanying heart rate changes" (1979). This description has a parallel with the research of Dansky and Silverman (1973, 1975) who found that in their play conditions as compared with their work condition, attention was more wandering and peripheral. In Hutt's study, the condition that most approaches what the heart rate is like in play was, significantly enough, looking out the window.

To this point then we have brought together three kinds of research--therapeutic, animal and child experimental--all of which can be read to give considerable support to Piaget's notion that play does not contribute as importantly to cognition as does imitation or exploration. This body of research shows that exploration has priority over play, has more persistence than play and seems to be more clearly related to learning.

Against this direction of thought, we can only raise the possibility that the apparent prepotence of exploration may be in part a product of the strange situations made use of in these studies. There is evidence in both the animal literature (Suomi, 1979) and the child literature (Ellis, 1979) that when children are in a setting with which they are already familiar, the introduction of a novel

object can lead to its almost immediate assimilation into playful themes without anything more than the most perfunctory moment of investigatory attention. Novel settings and novel people do give a predominance to exploration, but in more normative situations exploration does not have that priority at all. When children are in command of their circumstances and familiar with peers, play is the most characteristic and enduring of their responses. Normally, play is not secondary, but is primary in their activity. It is the kind of response that they prefer. Still, even if this is so and even if its tenacity and endurance creates a mystery for us, this is still not yet to gainsay Piaget's point that its cognitive role is illustrative and consolidatory rather than constitutive. One may enjoy play without learning much from it--though we are left with the anomaly cited earlier that these "distortions" of children or "fragments" of animals are accounted by some as the very ground of their learned flexibility, a point to which we will return.

II. The Disjunction of Directed and Undirected Thinking

We come now then to my second, parallel problem with Piaget, which is the relatively inferior role he gives to undirected thinking, as represented here by play, as compared with directed thinking, as represented here by imitation, exploration, etc. As we have seen there is some evidence that he is on reasonable empirical grounds for making such a disjunction. According to his viewpoint play is not cognitively speaking a particularly productive phenomenon.

If that is the case, however, what are we to make of what has now become a considerable body of research in which some forms of play, usually sociodramatic or make-believe, have been shown to be correlated (perhaps causally) with innumerable cognitive outcomes. We are referring to the work of Dansky & Silverman (1973); Fink (1976); Feitelson & Ross (1973); Lieberman (1978); Lovinger (1974); Rosen (1974); Saltz, Dixon & Johnson (1977); Singer (1973); Smilansky (1968); Smith & Syddall (1977); and

Sutton-Smith (1968). It is contended by some of these authors that the labile activity of the player increases his repertoire of responses and therefore he has more responses available when diverse responses are required on tests of creativity. Or it is empirically demonstrated that having available imaginative associative processes the individual is more capable of delaying reaction, is less aggressive, has better memory storage capacity and is more verbally fluent. As Sherrod & Singer (1979) say:

> It is almost impossible to argue other than that make believe play and cognition facilitate each other. The two must develop in parallel: they form bidirectional not two separate unidirectional systems . . . (We should not argue) for the influence of imaginative play on cognitive development, because training in fantasy activity necessarily involves training also in cognitive skills such as representation and imagery.

One way to bring this kind of data into line with Piaget's thinking, however, might be to argue that it is not actually the fantasy play itself that contributes to cognitive development, but that rather by being brought together by their high motivation for fantasy play, children are forced into various kinds of disequilibrating interaction with others which require them to decenter, take the perspective of the other, develop more adequate vocabulary and consistent thought processes. and Syddall and Pepler
Smith/(1977) and Rubin/(in press) argue, for example, that in the few studies where there is a causal link between experience in a play group and post test scores there is most typically a tutorial relationship between experimenter and subject which can itself be held accountable for the shift in scores. The work of Matthews (1977) suggests further that in the midst of fantasy play, the peers come into conflicts which lead to readjustments of an accomodative kind. Given that Piaget postulated such conflicts as a source of development, then perhaps these various studies on the linkages between play and creativity only mislead us into thinking that play itself is the formative agent. Rather, it may be that play is only the formative

context for the formative event, which is that of social conflict between peers or of children modelling from adults.

Still there are problems with this solution also. First, there are the indications that in solitary play both humans (Weir, 1962) and chimpanzees (Dolgin, 1979) do more novel things with words or objects, associating them in a greater variety of combinatory ways, than they do within the social constraints of others present. The findings here are few in number, but at least indicate another interpretation, the one favored by Lieberman, Singer et al., that it is something fundamental to the play experience itself that contributes to cognition--not just the social encounters that occur in the midst of that experience.

What I would like to do now, therefore, is to look more closely at the play experience to see if there might not be another kind of learning involved than that discussed by Hutt. Piaget's account of early play appears a useful vehicle for this discussion. Piaget's account of the sensory motor play structures of the first year of life accords nicely with his theoretical views. Infants who have been shown in sober exploratory activity developing schemas of sensory-motor response, are shown subsequently to be varying or distorting their own achieved sensory-motor responses in ways that they find particularly amusing. They throw their heads back with laughter, they kick the side of the crib with glee, they blow raspberries on their mothers' cheeks. It is easy to think of these examples as being of great affective value but of little cognitive virtue. They mimic cognition rather than contribute to it.

Piaget's account of the symbolic structures of the second year of life, however, seems to have a different character. There are, for example, a series of four steps in the development of symbolic play:

	0	where the child detaches his prior actions from their original contexts and displays them somewhere else (pretending to sleep on the rug).
IMITATION	1A	Next there is the projection of symbolic schemas onto new objects (the toy is put to bed).
	1B	Next there is the incorporation of imitated acts into play (child sweeps like mother).
IDENTIFICATION	2A	Next one object is identified with another (stones are food).
	2B	Finally the child identifies with another (plays mother).

Here in Piaget's account children's symbolic play is used as an illustration of the development of representational competence rather than as a mockery or distortion of it. Piaget does not give us a set of representational stages first, and then a set of play variations second, as he has done for the first year of life, with the various sensory-motor circular reactions and the plays derived from these. One might naively think that in the case of symbolic play that symbolic representation develops through this play activity, and that the play activity is what constitutes its development. One might think that the development of substitute objects in play (toys, etc.) is a precursor to the development of symbolic thought in general. This is the approach that Vygotsky has taken. This is the approach also that a number of researchers have taken, in seeking for relationships between Piaget's symbolic series and the child's development of language. If Piaget is correct in general, there should not be any anticipatory relationship between his kinds of play symbolism and kinds of linguistic symbolism. If Vygotsky is right there should be such an anticipatory relationship.

The results to date are mixed. Those who have used either Piaget's five stages in some more or less complex form have certainly found no one to one relationship between the two, but they usually have found some relationships. The symbolic play stages are certainly not totally irrelevant to the se-

quences of language development (Nicolich, 1977), to the contents of language development (Rocissano, 1979), to language comprehension (Fein, 1979), or to productive language beyond the first words (Kavanaugh, 1979). These results intensify the ambiguity of any purely affective or expressive interpretation of the stages of play symbolism as described by Piaget.

But again, of course, we could argue that what has happened here is that Piaget has perhaps underemphasized in his description the "amusing"qualities of these symbolic states. He has become caught up in the symbolic sequence that is illustrated there, and has unintentionally made it seem like a cognitive sequence, rather than as he really intends, only the illustration and distortion of the true cognitive sequence to be found somewhere else. I think it is quite probable that that has in fact occurred and the apparent discrepancies between the description of sensory-motor play and symbolic play are more apparent than real, and that although the

nature of symbolic operations in the second year are not otherwise described in such detail by Piaget, that is more of an oversight than a fundamental change of purpose. Play's symbolic operations are not meant in themselves to change thought processes.*

Still the few allusions we have made to interrelationships with language (and creativity) suggests that there may be more afoot here than Piaget has discovered. Perhaps there is a kind of learning going on in play at some more fundamental level than the kind discussed by Hutt, i.e. learning the novel properties of objects. In order to examine this possibility, however, it is necessary to take into account the more radical play theory of Gregory Bateson. In Bateson's cultural interpretation of play, play is not an awkward handmaiden to thought. In Bateson's theory, play is primarily a kind of communication, a phenomena which has to do with the way we interpret experience, the way we orient ourselves to meaning and to others. Orienting ourselves to meaning is often called framing in this kind of discourse. Sometimes it is called metacommunication because we are making communications about how we intend to make communications. Making these kinds of communications logically precedes saying what we have to say. People must know with what voice we speak before they hear the speech itself. Are we father, mother, lecturer, pro Piaget or against him?

But let us bring this whole thing to earth by taking an example from Piaget

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* Because Piaget very much limits his interpretation of play to the distortion of some original cognitive template, we were led to say in our earlier paper that it was as if (and we stress the as if) he had bootlegged a copy theory of play. Our reference was to the way he had limited his interpretation of the play phenomenon not to his really having a copy theory, which we carefully precluded. Then as now copy theory is a red herring. The limitations of his interpretation of play, however, are something else.

and reinterpreting it in these terms. Piaget's first clear example of one of his children at play in the first year is of T at 2 months.

> At 2 (21) T adopted the habit of throwing his head back to look at familiar things from this new position. At 0.2 (23 or 24) he seemed to repeat this movement with ever increasing enjoyment and ever decreasing interest in the external result: he brought his head back to the upright position and threw it back again time after time laughing loudly. In other words, the circular reaction ceased to be "serious" or instructive, if such expressions can be applied to a baby of less than three months, and became a game. (Piaget, 1962, p. 91)

Now, as we have said, Piaget is interested here in the repetition of the serious primary circular reaction in the non serious play. And he suggests the child does this "merely for pleasure accompanied by smiles and even laughter" (p. 90).

I would like to suggest, following Bateson and many others who have been working out the implications of his view over the past twenty years (Geertz, 1976; Goffman, 1974; Handelman, 1974, 1977; Stewart, 1979; Turner, 1974), that the example we have just given is much more complex and much more cognitive than even Piaget describes, and that it may be interpreted to demonstrate a number of characteristics.* Most of these characteristics I will present are already familiar in the various theories of play. I do not think, however, that they have been brought together as an account of what might be thought of speculatively at least, as the distinctively structural character of the imaginative and expressive life. Since Eliot Turiel introduced the polytheism of psychological, social and moral domains yesterday, I will now add my own to this growing pantheon. Given the place of sports and the arts in cultural life, this is undoubtedly, in his terms, another system of knowledge. I begin with Bateson's primary point.

1. Our first structural characteristic is <u>REFRAMING</u>. The fact that the infant

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* We are particularly beholden in this analysis to Susan Stewart's recent study of nonsense (1979).

smiles shows that he discriminates the actions in the last part of this observation as different from the actions in the first part of this observation. All of Piaget's examples in the first year of life have the child either smiling or laughing which make it a strong possibility that this is the main signal which infants can use to communicate such a reframing of activity. Older children use verbal cues about pretense, and they negotiate the different frames they wish to use, but in the infant's case what is being done here is, according to Bateson, basic categorical work of a communicative kind. (The infant is saying that this is other than proper behavior--not p. but - p.)

Of course, we do not know how the infant can do this, any more than we know how the dog in Bateson's description can know that his playful nip connotes a bite without connoting what a bite connotes. But what we must make clear is that this reframing of the event is of a hierarchically more primary order than the play event itself. It is a kind of communicative accomodation without which the players cannot join terms on their playful assimilation. And as Garvey and others have shown there is a constant interpenetration of social play by this kind of accomodative framing activity (1977). Learning how to create frames that will be acceptable to others and promote the assimilations of play is primary stuff in early childhood.

2. REVERSALS. Our second characteristic of play comes from the major emphasis in Freudian theory that play involves a shift from the passive to the active. Play involves some kind of capacity for reversal. A primitive mechanism which might mediate this discrimination is the child's very early ability to negate the flow of stimulus events by shutting eyes or turning the head away. This turn-off mechanism could give us at least part of the effect. In addition to turning off the circular reaction, however, there is an added switch in direction of intentionality from goal to instrumental behavior, a definition often used as a characterization for play

behavior (Miller, 1973). Perhaps this built-in capacity for reversal may also mediate the reframing just mentioned. The concept of reversal or inversion has in recent anthropological literature been used as a way of describing pervasive feature of cultural life (Babcock, 1978; Turner, 1974), and it would not be too far fetched, against the background of that literature, to consider play as a micro rite of reversal or inversion. Elsewhere we have analysed children's development through play in terms of a hierarchical series of reversal operations--reversals of control, roles, tactics, rules, identities, etc. (Sutton-Smith, 1978). When Piaget says in our example that the infant continued with "ever decreasing interest in the external result," he is certainly implying such an ability to switch direction. Chukovsky (1966) says, "they only know sense, who nonsense know," implying perhaps that one can learn a more flexible approach to routine behavior through "playful" reversals in orientation. "The envisagement of possibility" would seem to be a kind of learning.

3. Our third major structural category we derive from Vygotsky's theory of play, namely that it involves the ABSTRACTION OF PROTOTYPES. In addition to being a reframing (the smile) and a reversal (decreasing interest in the external result), the actions that are played with are also a kind of abstract (see also Fein, 1971). They are taken out of their original context in these sensory-motor examples, no less than they are in the symbolic examples where the child pretends to sleep in the new situation. It is true the sensory-motor distancing is on a more micro level and is still in the same physical setting. But the instrumental behavior is clearly detached. As Piaget says, "he brought his head back to the upright position and threw it back again time after time." But we know that he is not doing that to look at the familiar things from a new position. Throwing back the head is detached from that intentionality and therefore from some of the original stimuli.

The compelling importance of thinking of play as a kind of prototypic abstracti

is conveyed to us by Vygotsky's brief example: "Think of two girls who are sisters playing a game called two girls who are sisters" (1967). Now obviously they can play bitchy sisters or polite sisters or alternate the both, but they do not play sisters as they are in all their ordinary contextualized behavior. Play cannot proceed without some selection from ordinary behavior. The principles of such selection have never been fully studied, although we are familiar with the notion of play as dealing in caricatures and stereotypes (Sutton-Smith, 1978b). Children's behavioral abstracts like their toys and like primitive masks (Turner, 1967) appear to deal in the use of

salient characteristics for purposes of rapid and vivid information acquisition and usage. In Piaget's examples it seems that a primary characteristic of these early sensory-motor plays is the abstraction for subsequent manipulation of the child's own grosser motor response from the stimulus context.

4. THEME AND VARIATION. The notion of theme and variation does not derive from any one of the major play theories (except perhaps Berlyne), but it seems to be as fundamental to play as it is to aesthetics. What we see so often is that the child in play focuses on some central act or object and then permutates that action through some of the immediately available contingencies. In all of the symbolic levels mentioned above by Piaget we have such a central vector (the sleeping action, the toy, the mother) which is brought into variable relationships with surrounding phenomena. The toy doll is first put to bed, is fed, is clothed, is toileted, is put to bed, is clothed, etc. In the sensory-motor example we would suggest that head throwing back is also both repeated and variable behavior. What is implied here is that the theme and variations kind of organization is an infra structure underlying both those of the sensory-motor and symbolic kinds discussed by Piaget.

Speculating further on the peculiar character of this vectorial-permutative structuring in play, one observes a strange reversal from the child's vaunted egocentricity. Here the centration is objectified as some action or object or toy, external to the child; and the toy is then out there in the world brought into novel relationships with surrounding phenomena. It is as if the child's very egocentricity is objectified in the acts and objects, thus reversing the typical centrational orientation of subject-object relationships. Furthermore, the vectorial center of action then becomes background for the foregrounded novel variations and novel relationships. The vector is the constant (the stereotype) and the variations are the figures against that ground of action. I have elsewhere shown how most of children's early, two to three year old stories have this same character. Thus:

The monkeys
They went up sky
They fall down
Choo choo train in the sky
The train fall down in the sky
I fell down in the sky
I got on my boat and my legs hurt
Daddy fall down in the sky.

Going up and falling down is the reversible vector. Monkeys, choo choos, train, Daddy and I are the variations. Here an action is the central vector and characters are the variations. More typically in later stories the characters are the central vectors and actions are the variations (Sutton-Smith, in press). Even in children's games in mid childhood, we have a similar kind of organization in what I have called central person games (Sutton-Smith, 1959).

5. BOUNDARIED SPACE-TIME. We have wandered further than Bateson would to discuss what seem to us to be some essential structural characteristics of play (reversibility, abstracted/ prototypes, theme and variation). But these, of course, can only occur within the context given by the reframing activity and this becomes even clearer when we discuss other matters that Bateson would take into account, namely the need to clearly indicate for communication purposes the boundaries of the behavior in space and time. At the adult level we have no difficulty with this because of the existence of spaces and times set aside for play in stadia, theaters, and playgrounds. All of these contexts communicate immediately what is supposed to be afoot when people gather there. In early infant play these boundaries are less explicit to us as adults, apart from those we ourselves impose by/creating play centers and the like/ for children. But there is/no reason to believe that even infants/do not have a similar need for boundaring. When they have slipped amusedly into a new frame, they exist in a world of boundless possibility or impossibility unless limits are quickly sketched. How is this achieved? There seem to be a number of techniques for boundaring (Herron & Sutton-Smith, 1971).

a. The most basic one is Miniaturization. Most toys are clearly marked as apart from the proper world by their scaled down and stereotypically salient features. Their micro scale shows clearly what can and cannot be done with them. They are tightly confined. Even in the sensory-motor toys we give infants (rattles, etc.) careful steps are taken to see that the infants cannot hurt themselves, that is, that behavior does not exceed appropriate built-in limits of the toy.

b. Hyperbolation, exaggeration, giganticism are also devices used with children's toys, though usually with the large soft toy variety so they can again do no harm. Small toys can be made of hard materials. Large toys must usually be made of soft materials, if limits are to be maintained. Clearly this kind of gigantic approach is of secondary importance to miniaturization in the toy world, but as applied to the children's own spontaneous behavior it seems that hyperbolation may well be primary. It is an empirical question as to whether the variations that children introduce into theme and variational play are only variations or are also exaggerations. Sometimes they clearly are the latter, and some have taken the position that such exaggerations are critical to our understanding of play ("galumphing" as Miller, 1973, has called them, borrowing from Lewis Carroll). What seems reasonable is that the more the play shifts from the solitary to the social axis the more necessary might become such exaggerations in order to communicate to others the true/untrue character of the frame in which the player is engaged. By writing the actions large, their separate boundariedness is made explicit, and decontextualized from the situations with which they might otherwise be confused. In sum, caricature heightens figure ground relationships, as well as communicates information rapidly, the point which we made earlier. Stewart (1979) in her study of nonsense has even suggested that it is only through this kind of exaggeration that we can actually abstract the figure of fun from its ground of sobriety. Which at the very least reminds us that our pre-

sent distinctions between reframing, reversal, abstraction, theme and variation, boundariedness, miniaturization and exaggeration are of an intricate structural reality strongly interwoven in human behavior.

As well as space, time itself must also be bounded. Otherwise moving into a new frame might permit of infinite temporal possibilities and impossibilities. The one that we derive from Stewart as particularly useful to us is:

c. cyclical repetition. By repeating the play action children can again boundary time. Instead of being caught in its incessant unidirectional flow, they can bond it to a beginning, a middle and an ending of their own volition. Their circularity at the sensory-motor level ("he threw his head back again and again") is a micro scale of the adult football season. Both repeat and delimit. The fundamental problem of metacommunication is "What is within the frame?" Repetition of cyclic sort makes that abundantly clear. Throughout childhood, children's primary technique for managing time will be cyclic repetition through turn taking.

6. MODULATIONS OF EXCITEMENT. What is not hinted at either in Bateson or in Piaget, but becomes primary in Berlyne's approach to play is the modulation of arousal. In the patterns of play of which we have been speaking, children are not simply varying frames because they must communicate, or categorize flexibly, or because they seek mastery of their circumstances. They are doing it because it is generally the most exciting activity which they know. Although the bulk of play theory has to do with the socializing effects of play (or their unsocializing effects), children themselves are there primarily for the pleasure. We should therefore direct our attention to what are the structural characteristics of their excitement, as have several researchers such as Shultz (1979) and Mihayli Csikszentmihalyi (1975, 1979). All we wish to do here is to point to the tempo of excitement in Piaget's example and suggest the presumption of mounting excitement, anticipations

and climaxes. In the first year of life we see clearly the child's increasing temporal control over such tempos, just as the same can be traced in children's games, as climaxes become less episodic and more cumulative (Sutton-Smith, 1972).

7. CONCLUSION. What we have done here is suggest a hierarchy of structures that might be involved in the episodes of sensory-motor and symbolic play that Piaget has used for his own discussion. We have borrowed our concepts from the major kinds of play theory as shown in Table 2.

Insert Table 2 about here

In these terms it might be argued that Piaget has paid attention only to lower level and more content influenced categories, and perhaps his interpretation of their character is due to this surface nature of his treatment. What appears as undirected thought, pure or distorting assimilation at the content level, is here demonstrated to involve at least two deeper levels of operations (first, framing and second, categories 2-6). Furthermore, the second of these levels involves variables some of which (like reversibility) are also required in convergent or rational thinking, but others (like abstracted prototypes, theme and variation and modulation) are the heart of divergent and imaginative thinking and, therefore, of playful and artistic productions. The peculiar syntheses of the imagination and the arts involve bringing central schemas or ideas into unexpected relationships with peripheral events in a manner that preserves the excitement of those relationships in the perceptual medium. Directed thought, on the contrary, seeks to dissociate central ideas from the excitements of mediated and ambiguous relationships. In these terms the dialectic which Piaget introduces between imitation and play does insufficient justice to the autonomous structure of imaginative thought as a distinctive kind of thinking in perceptual media. If there is any truth to these assertions then much is being learned in play, but it is of another kind than that being dealt with by Piaget or by Hutt.

III. Play as an Infantile State

Piaget has dealt with play most thoroughly at this age level. Most of my comments, therefore, have been directed at the same age level. At first sight one imagines that he is simply persisting with a work ethic, sociological kind of view within which children's play is what children do, but not what adults do. When Piaget says such play gradually gives way to the adapted and rational thought of the adult, one is inclined to find in this some kind of historical fault. That is, that he is persisting with the view that children's work is their play, that what children do cannot be very important anyway, etc. However, perhaps there is more to his view than mere historical lag. Perhaps what is at fault here is the definition of the concept of play itself.

Pure Assimilation as Reverie

If instead of using the word play when discussing Piaget we used the word reverie, much of what he says would fall into place. Reverie is that kind of semi-automatic, purely assimilative process which takes over our minds at in-between times and places and within which we make no conscious decisions. We do not frame it, and whatever goes on in it is beyond our autonomous actions. Now this kind of thing is certainly a dream-like set of "distortions" of conscious life. It is also possible that children have more of it because they may have more need to subordinate reality to wishful thinking. On the other hand, given that the same phenomena invades our adult lives incessantly as we drive our cars to and from work, as we sit bored in faculty meetings or lectures, then perhaps children do not have more of it. Or perhaps they do not have more of it than those adults who spend most of their lives in the power of others. Reverie may be more a function of being unempowered than of being a child.

If we surrender reverie to Piaget, then what of the mass of human play where the child alone or with others chooses to pick up his blocks or her jump rope? Here it seems that we have another kind of domain, a more autonomous one and one subject to the various phenomena already dealt with--reframing, reversals, etc. Presumably this domain is easily invaded by reverie, hence perhaps Corinne Hutt's variable heart rates, but unless we are to ignore the communication theory of Bateson or the arousal theory of Berlyne, this domain does not seem to correspond sufficiently to Piaget's account. In hindsight, we might suspect that if Piaget had studied his infants' play in a social context of the mother and infant, then these other variables might have been more in the forefront of Piaget's thinking. Instead he generally studied the infant (1) in a solitary situation and (2) as if his own presence as investigator did not make any difference. Now while solitary play is an important form, all of our other evidence on mother-infant relationships would lead us to suspect that the original forms of any kind of infant behavior are very strongly affected by the social relationships with the early nurturers. One would wonder if Piaget's babies would have laughed as much in the examples he gives if they had not known he was there. One wonders also whether Mrs. Piaget played the usually complex games of tickling, turn taking in noise making, contests with hair pulling and fingers in mouths, choral rhythmic activity with jiggling and singing together, the cumulatively exciting games of Beep Boo and This Little Piggy, all of which are often the social inheritance in the homes of children of parents of advanced intellectual or economic status (Sutton-Smith, 1979). One even wonders if the circular reactions of the accomodative sort may not themselves even have been modelled by these complex interactions between mother and child. Certainly the secondary circular reactions in which the child at about four months notices an effect he has produced outside of himself (as in making the mobile rattle) have long

been produced by the solicitous mother imitating the infant in the first two months of life. The infant with the high interactant mother has secondary circular reactions from her much earlier than they are recorded in the solitary behavior of Piaget's precocious infants.

In sum, it is difficult not to conclude that by considering the kind of play largely of babies when solitary Piaget has been predisposed to a view of play which is more suitable for the most solitary kind, namely reverie.*

Culture as Played

If we follow Piaget's own principles of genetic epistemology, however, we might seek to illuminate the earlier states of play by an examination of the end state. In short, we might expect that the study of games or sports as played by adults (not adult logic) might tell us most about the meaning of infants' play. Even more appropriately, we might expect that an examination of the role of play cross culturally would be illuminating.

While there is certainly no consensus on what that meaning is (Schwartzman, 1979), there is considerable agreement that the play of adults does not stand outside their culture, but is functionally related to it. More collaborative cultures have more collaborative kinds of games, more competitive cultures have more competitive kinds of games. As cultures change, the domain of play seems to be one of the most open culture areas in which such changes first render themselves. As anthropologist Keesing (1960) says:

> Recreation, by and large is a behavioral zone which is very much an open system. It is strongly marked by fictional premises, by elective variation, by novelty, by risk taking, by relative freedom from demanding goal orientations and strong sanctions.

Not that one would for a moment want to oversimplify the very considerable

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* Our second title for this paper, facetiously, is "And apart from all that Mrs. Piaget, How did you enjoy the play?"

diversity of usage being documented in current studies of play, particularly as expressed in the annual meetings of The Association for the Anthropological Study of Play (Lancy & Tindall, 1976; Salter, 1978; Stevens, 1977). In some cases the cultural play seems to be an inversion of the larger cultural system, a message as to the dangerous affective life that underlies it and which should not be tampered with if stability is to be maintained. At least this is how Geertz sees the Balinese cock fight (1976), and how Turner describes much tribal ritual (1974). However, in some interpretations play is the mirror of cultural life rather than its inversion. In others the play area is the domain of instability and conflict, and in yet others it is in contrast, the domain or communitas and unity as compared with disequilibriums of war and economics. Clearly, the cultural relationships of play are variable, just as are the adult-child relationships about play. In some circumstances the play of children is deprecated and they are beaten if they play; in others they are not called adults until they give up play; in yet others play is encouraged. What we have in common is that the play enters always into some systemic pattern of social relationships and mythic beliefs. It does not stand aside as a non-entity and unimportant part of the cultural whole. It is for these reasons that some interpreters of culture see each cultural reality as a product of both ordinary affairs and play. Play is that interpretation of the total cultural structure which provides an underlying sense of its overall reality.

Given this kind of interpretation of Bateson and Geertz and others, then the child's play must in due course integrate the child into the larger cultural patterns of behavior and belief. It cannot only be a subordination of reality to personal wishes, although that may be one of its aspects--reverie--as we have seen. The social play of the child and even most of his solitary play must be instead a gradual integration of the child into the constructed reality of his larger culture. If reality is what the culture invents, as many now opine (Goffman, 1974), then play if it is successful is an integration of the player to the cultural reality, though perhaps in his own variant terms. It

unites him into the system of interpretation which is that kind of cultural reality. It does this by reinforcing the kinds of framing that it approves, and by sustaining in one way or another those mechanisms of reversal, abstract stereotyping, theme and variation and boundarying, that we have discussed.

Perhaps Piaget has missed this kind of interpretation by assuming too nineteenth century a dualism of what is real and what is not, and by ignoring the role of play in culture in his discussion of play in infancy.

Conclusion

We have said that Piaget makes an imbalance between play and imitation, between rational and imaginative thought, and between infant and adult play. On behalf of Piaget's views we have suggested that evidence from play therapy, from the animal literature and from the exploratory literature could be advanced to suggest that play merely distorts cognitive activity but does not contribute to it in a substantive way. Further, it could be argued following Piaget that where play seems to have made a contribution to thought, this may actually have been a contribution arising from the social context within which the play took place. It was suggested finally that if we view Piaget's description of "pure assimilation" as a form of reverie alone, then there is very little to argue with in the case that he presents.

On the other hand, there are other research literatures which seem to imply that for some other kinds of play at least, more active constitutive relations might be found with thought and adaptation. In the animal literatures there seem to be relationships between play and flexibility. In the child literature there are relationships between play and creativity, between play and language, between play and problem solving. In the anthropological literatures there are relationships between kinds of play and cultural world views. So we are prompted to a view of ourselves

play which sees infant play in the light of adult play, which highlights the communicational character of play as a form of framing, the conative character of play as a form of reversal of ordinary cultural intentions, the affective character of play as a kind of modulation and the cognitive character of play as focusing on the abstraction of prototypes, the permutation of themes and variations and the boundaring of space and time. We see play in these terms as a distinctive domain of knowledge with its own kind of structure and its own function--which is the management of reality through ludic techniques that all cultures seem to find indispensible to their sense of the life that is worth living.

But still in all fairness, when we say these latter things we have clearly switched epistemological premises on Piaget. His views have to do largely with solitary individuals and cognitive processes within the head. Despite a bow to the critical importance of social interchange in development, his work is within the individualistic philosophical and psychological tradition, perhaps within the realistic and rationalist one. Most of the important criticisms advanced here, on the other hand, derive from the more sociological constructive tradition, in particular from communication theory. What has been said here, therefore, is not so much to critique Piaget for whom play was not, after all, a major concern, but to lay down a foundation for thinking about play more comprehensively. I would finish by reiterating my own personal debt to Piaget for making what had been for me a slightly cranky personal concern into one that I can now regard as of central importance to developmental psychology.

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Table 1

Characteristics of Investigation and Play, and More Generally of Specific and Diversive Exploration (From Hutt, 1979)

A	Investigation	Play
1.	Synchrony of visual and tactile receptors	Desynchrony, or only transient synchrony of receptors
2.	Intent facial expression	Relaxed facial expression
3.	Stereotyped sequence of behavioural elements	Variable and idiosyncratic sequence of elements
4.	Elements of relatively long duration	Elements essentially brief
5.	Elicited by novel stimuli	Never manifest in the presence of novel stimuli
6.	Implicit query: "What does this object do?"	Implicit query: "What can I do with this object?"
7.	Shows linear decrement with time	Is quadratic function of time

B	Specific Exploration	Diversive Exploration
1.	Concerns those inspective, investigative responses directed to a particular source of stimulation, i.e. stimulus-oriented	Concerns those activities which seem to increase stimulation irrespective of source, i.e. response-oriented
2.	Occurs in presence of highly stimulating (by virtue of novelty, complexity, etc.) set of environmental factors	Occurs in absence of specific environmental stimulation
3.	Consists of consummatory response to stimulus-change.	Consists of instrumental responses for stimulus change
4.	Attention governed by external cues	Attention dependent on internal state
5.	Characterised by response stereotypy	Characterised by response variability or entropy
6.	Occupies superordinate position in motivational hierarchy in that it can inhibit most tissue-preserving activities	Low in motivational hierarchy and can be inhibited by almost any other drive state

Table 2

Play Theoretical Variables	Class of Psychological Event	Kind of Play Theory
1. Framing	Communication	Bateson Geertz Goffman Handelman Schwartzman
2. Reversal	Conative	Freud Erikson
3. Abstraction of Prototypes	Cognitive	Vygotsky
4. Theme and Variations		
5. Boundaried Space and Time (Miniaturization, Hyperbolation, Circular Repetition)		Stewart
6. Modulation	Affective	Berlyne Ellis Hutt Shultz